



Decommissioning News.

A newsletter to inform the public about NASA's Decommissioning Activities.

Twenty-Fifth Edition. June 2008

Project Update. Decommissioning Progress Written in Cement.

A substantial spring cleaning marked recent decommissioning progress at the Plum Brook Reactor Facility (PBRF). Throughout the spring NASA and its contractors accomplished several important tasks, highlighted by removal of the bio-shield. Constructed of concrete and rebar (steel embedded in the concrete), and as much as eight feet thick in some sections, the bio-shield provided a layer of protection for workers in the Containment Vessel when the reactor was operational.

Bio-shield Removal.

The focus of the bio-shield removal was on the activated metal within and around the structure. Activation occurs when metals are exposed to radiation, which changes their composition. When the reactor was operational, metals closest to the core became activated. This was especially true of the thermal column, an eight foot high, three feet in diameter steel cylinder surrounded by the bio-shield. The thermal column had formerly served to reduce the energy and heat of neutrons that had passed through the reactor. According to NASA Decommissioning Program Manager Keith Peecook, the bio-shield and thermal column removal represented "a major project accomplishment, one that involved meeting several challenges." He explained that the structures had been "built to last. They provided great safety and security to reactor workers forty years ago and were not made easy to remove."



Workers from radiological contractor MOTA Corp. had to make a series of core borings deep into the concrete and then set up a powerful diamond wire saw to make a series of angled cuts into the bio-shield. The end result was the removal of a pentagon-shaped portion of the bio-shield. Then they used the Brokk, a remote-controlled piece of construction equipment containing an arm that could be fitted with a variety of tools to demolish the Containment Vessel walls and reach the thermal column. Peecook likened this process to "cutting out the eyes nose and mouth of a jack o'lantern, from the inside-out." By reducing to rubble the bio-shield concrete surrounding the thermal column, workers were able to remove it all. They sprayed the structure with a lockdown substance to fix any loose contamination in place and packaged it for shipment to the Energy Solutions licensed disposal facility in Utah. During this demolition of the bio-shield, NASA removed hundreds of tons of concrete for disposal.

Grouting Activity.

This spring, several below-ground areas of the Containment Vessel and other PBRF structures were filled with tons of grout, a cement-like substance. Filling structures and embedded piping (located at least three feet below grade) with grout serves an important function. It stabilizes pipes and empty structures - and helps them resist corrosion. In April, MOTA workers poured 180 cubic yards of grout (the contents of 10 cement trucks) into the Sub-pile Room, an area at the bottom of the former reactor location - 46 feet below grade. All of the concrete in the Sub-pile Room was decontaminated earlier this year, before the room underwent Final Status Survey (FSS) work, confirming cleanup levels had been met. Peecook said removing the bio-shield and grouting the Sub-pile Room means "Nearly all the last vestiges of the reactor are now gone."



Project Update article photos.

- In the photo in the upper right, Two workers conduct a core boring into the concrete of the bio-shield, to position the high-powered diamond wire saw.
- In the photos in the right center, In the Hot Lab Building, workers removed all loose and fixed equipment, including the doors (left), then decontaminated the concrete (right).

CONTINUED ON PAGE 3.

Clauss Construction to Head Project Completion Efforts.

NASA has awarded the Decontamination and Waste Disposal contract to Clauss Construction. The Lakeside, CA, based contractor will lead efforts to complete the decontamination of the Reactor Facility buildings and grounds, and the preparation of the site for the Final Status Survey. Clauss Construction will undertake the project's decontamination and radiation protection activities. These will include the safe packaging, shipment and disposal of all remaining on-site low-level radioactive waste and contaminated soil at the reactor site.

This cost-plus-fixed-fee contract is valued at more than \$33.5 million, with work scheduled to begin in July and be completed by December, 2010. Clauss heads a contracting team that also includes Safety and Ecology Corporation (SEC), MACTEC and Cavanagh Services. NASA Decommissioning Program Manager Keith Peecook said "NASA set forth very specific expectations in its Statement of Work to be performed. Clauss Construction submitted the strongest proposal and we now have the team in place that will bring the Decommissioning Project to a safe and successful conclusion."

page two.

OTHER WAYS TO RECEIVE DECOMMISSIONING Information.

Decommissioning Website.

For project updates,
fact sheets, newsletters,
and to ask questions,
visit us at

www.grc.nasa.gov/WWW/pbrf

24-Hour Toll-Free Information Line.

For recorded project
updates and to ask
questions, call

1-800-260-3838

Community Information Bank.

To review documents, visit the
Decommissioning Project
information repository at the
BGSU Firelands Library.

Speakers.

To arrange for a NASA
representative to make
presentations to civic,
community and school
organizations, contact

Sally Harrington

NASA Public Affairs Specialist

216-433-2037, or

email: s.harrington@grc.nasa.gov

or call 1-800-260-3838

NRC Gives NASA Final Status Survey Plan Official Approval.

It was long anticipated and never really in doubt. But as baseball Hall of Famer Yogi Berra said, "It ain't over 'til it's over." So NASA's Plum Brook Reactor Facility (PBRF) Decommissioning Team was pleased when it received official approval of its Final Status Survey Plan from the U.S. Nuclear Regulatory Commission (NRC) in March. The Final Status Survey (FSS) Plan demonstrates how NASA will reach NRC required on-site project cleanup levels - called Derived Concentration Guideline Levels - (DCGLs) at the end of decommissioning. Combined, these on-site levels cannot exceed 25 millirem per year, the level needed for unrestricted use under what is termed the "Resident Farmer Scenario." The entire PBRF site must meet the cleanup levels before the NRC can terminate NASA's reactor license.

The NRC indicated preliminary approval of the Plan last August, initiating a public comment period on the Plan (no comments were received). NASA subcontractor SAIC subsequently undertook FSS field work in the Reactor Office and Lab Building, Service Equipment Building and the Sub-pile Room of the Reactor Building. SAIC also began field work in the Fan House.

While making important progress in achieving the project's on-site cleanup goals, NASA has been working to establish new DCGL's for off-site areas along Plum Brook. In August 2005, some areas were found to have small amounts of cesium resulting from some minor water leakage during normal reactor operations prior to October 1968 (when the leak was repaired). NASA took more than 1,200 sediment samples from fall 2005 through spring 2006. None of the levels posed a public health concern. NASA then began working with Sandusky-based hydrogeological consultants Haag Environmental to determine the full extent of where the cesium may have traveled. They analyzed another 1,000 samples, examining every area where the material may have migrated over time. The results of this second effort were consistent with the first. Only a few areas showed slight elevations and none posed a public health concern. NASA provided the NRC, and state and local officials, with a series of sampling results reports earlier this year.

In addition to characterizing the off-site cesium levels, NASA decided to develop new cleanup levels more representative of land uses along Plum Brook. These were developed through modeling how people might come into contact with the cesium in ways that would be different from a "Resident Farmer," the scenario used to develop on-site specific cleanup goals. NASA considered the possible dose someone might get as an "Urban Gardner," a resident along the brookside, a Country Club maintenance worker or a "Natural Area Recreation Day User". Each scenario examined possible exposure pathways, such as direct exposure, inhalation, sediment ingestion and vegetable consumption.

NASA also decided to adopt, in off-site areas, a cleanup standard even stricter than that employed on-site at the PBRF. Off-site DCGL's will ensure the dose is no more than 15 millirem per year. This level is consistent with the U.S. Environmental Protection Agency standard under its Comprehensive Environmental Response Compensation and Liability Act (CERCLA). This standard is used to govern large environmental cleanup projects under the Superfund program (the reactor decommissioning is governed by NRC requirements).

NASA Decommissioning Program Manager Keith Peacock said the off-site DCGL's reflect "...the same prudent approach we have used throughout decommissioning." He also pointed out that NASA is working, as it has throughout decommissioning, to keep any exposure to radiation as low as is reasonably achievable (ALARA). Peacock said this approach "may result in doing spot cleanup in some areas, considering the area's ecosystem and accessibility by the public." He said no cesium level has been found that would exceed the off-site DCGL's, adding that NASA would submit a report on the proposed off-site cleanup levels to the NRC in July. NASA will also produce and distribute a fact sheet on the off-site sampling results and new DCGL's this summer. ■

Thousands Celebrate. NASA'S Birthday at Glenn Open House.

Did you ever throw a party for thousands of friends? NASA Glenn did just that recently, hosting Open House events marking NASA's 50th birthday as an agency. Open Houses took place at both Glenn's Lewis Field (Cleveland) and Plum Brook Station facilities. On May 17 and 18, more than 20,000 northern Ohio residents visited Lewis Field. Then, on May 31 and June 1, more than 13,000 visited Plum Brook Station (PBS). The Lewis Field Open House was the first since 2004 while PBS opened its doors to the public for the first time since 1999.

Both Glenn facilities presented visitors with a wide array of attractions, tours and demonstrations. At Lewis Field, visitors had the chance to tour several facilities, including the Ares I-X Manufacturing Facility. There, the new Ares rocket is being developed as an important part of the Constellation Program. The program's mission is to send astronauts back to the Moon and later to Mars. Visitors also flocked to other Lewis test sites. These included the Zero Gravity Research Facility, Icing Research Tunnel, Aero-Acoustic Propulsion Laboratory and two wind tunnels. Astronauts Charlie Carmada, who flew on the space shuttle Discovery and Carl Walz, who flew on four space shuttle missions, were on hand to greet visitors and sign autographs. In addition, Glenn's Visitor Center was home to several presentations and space museum exhibits.

At PBS, visitors climbed aboard buses that stopped for tours at the Space Power Facility (SPF) - the world's largest vacuum chamber. The SPF is a key facility for testing the Orion crew exploration vehicle (the eventual successor to the space shuttle). Visitors also stopped at the B-2 Facility and the B-2 Control Center. The B-2 Facility conducts rocket testing under conditions simulating the earth's upper atmosphere. The Control Center conducts rocket test firings and gave tour participants a re-enactment of a test firing. The PBS Open House also included hands-on educational activities, exhibits and demonstrations.

According to NASA Glenn Public Affairs Specialist Sally Harrington, this spring's Open House "gave folks an up-close-and-personal look at two important NASA facilities. They were able to look back at NASA's 50 years of scientific and technical excellence. We thank our guests for helping to celebrate NASA's birthday and look forward to making our northern Ohio neighbors part of our future events." ■

NASA Glenn Open House article photos.

■ In the photos in the upper right, Visitors to the Lewis Field Open House were treated to a variety of hands-on, interactive exhibits. To the left is Cratos, a small-scale, tracked test rover (designed at NASA Glenn) for descending moon craters. To the right is the interactive Hydrodynamic Lubrication Bearing Rig, which demonstrated how a bearing works with water, oil or air.



PROJECT UPDATE CONTINUED FROM PAGE ONE.



Asbestos Removal and Concrete Decontamination.

The few remaining vestiges of the reactor can be found in the former quadrants and canals of the Containment Vessel. Its concrete walls and floors have been undergoing asbestos removal, now virtually complete. The walls had been covered with a protective coating (or mastic) that had served to minimize contamination in the concrete. But the mastic contained asbestos, which had to be removed. Workers used a variety of tools, including the sponge jet blaster (which is similar to a sandblaster) to remove the asbestos.

The spot cleaning of lightly contaminated concrete was another important spring task. Workers used the sponge jet blaster and other smaller tools to conduct these efforts throughout the Reactor Facility. While bio-shield concrete was packaged as low-level radioactive waste (LLRW), much of the remaining concrete in other PBRF areas was decontaminated to project cleanup levels. This "free released" material can be recycled - or used as clean fill once the demolition of PBRF buildings is complete. Peacock said NASA has free released more than 830,000 pounds of concrete, adding, "By not sending it to a disposal facility, we realized substantial savings."



The spring cleaning put the final touches on several tasks that had been nearing completion. They included grouting previously cleaned embedded pipe systems, and shipping more than a million pounds of LLRW to Energy Solutions (and more than 10 million pounds since decommissioning began). According to Peacock, "We got a lot done under our old contracts (which expired May 31), work we had initially envisioned as being part of the new contract." He noted that the latter's title is the Decontamination and Waste Disposal Contract (see box on page one). But, he added, "We've done so much of this work already" that the new contract is "being referred to as the follow-on contract." He

also said that in the next several weeks, the project's priority is FSS field work being conducted by subcontractor SAIC. "The FSS is what we consider our critical path work," he concluded. "And we're now on the path to completion." ■

More Project Update article photos.

■ In the photo in the upper left, In April, workers pumped tons of grout into pipes and empty structures in the Reactor Facility.

■ In the photo in the lower left, This spring, NASA safely shipped more than one million pounds of packaged low-level radioactive waste, including these boxes being loaded on a flatbed truck.

page four.

Glenn Goes Green for Renewable Energy.

Throughout the years, astronauts have remarked how green the earth looks from space. NASA Glenn is a leader in alternative energy research, working on the development of renewable energy sources to make the earth a little greener. In fact Glenn's efforts - at both Lewis Field and Plum Brook Station - go back more than three decades, working with wind, solar and biomass energy.

In the mid-1970s, Glenn took the lead in the experimental development of wind power. The first wind turbine connected to an electrical grid began operating at Plum Brook Station (PBS) in 1975. Two years later, the Mod-O wind turbine would be the first multi-megawatt turbine capable of providing electric power to thousands of homes. This pioneering spirit continues today at Glenn, where research into a wide variety of "green" technology is being conducted. Glenn is heavily involved in developing photo-voltaic technology - harnessing the sun's energy and tying it to a power grid. Glenn is also a center for research on regenerative fuel cell system technology, storing the sun's energy for use during the night and to power future space exploration, especially lunar landing and ascent operations. NASA Glenn's commitment goes beyond research, though. The Center's Master Plan, released in August 2007, calls for the use of solar energy and heat pump technology in five Glenn buildings, benefiting the environment two ways - by reducing energy use and emissions.

NASA's energy research has other potential earthly applications, as Glenn is planning to work with the Great Lakes Science Center on a hydrogen fueling station for fuel cell buses. The proposed station would generate hydrogen by splitting water, using an electrolyzer powered by wind turbines and solar arrays - to potentially power Cleveland's surface public transportation. Other Glenn research is being conducted at its former Heated Tube Facility, on alternative fuels, taking existing sources such as coal, methane gas, biomass and shale oil and turning them into a cleaner, more economical alternative to expensive commercial jet fuel.

In recent months, Glenn has had several opportunities to demonstrate its green technology initiatives. Last December, Dr. Valerie Lyons, Chief of Glenn's Power and Space Propulsion Division, gave a presentation on the Center's past, present and future energy research before a large gathering of NASA staff (and representatives from the environmental and energy industries and academia), at the NASA Green Forum, held at the Ames Research Center in California. The presentation was so well received that it was repeated for Glenn employees on March 4 and was a staple of Glenn's own Green Energy Forum, held on April 22 (Earth Day). According to Lyons, many forum attendees had been unaware that Glenn has for decades collaborated with other federal agencies, including the Environmental Protection Agency, the Energy Research and Development Agency and the Department of Energy. She noted that similar collaborative efforts with other NASA Centers will result in "increased communication...for sharing energy related NASA technologies, for the benefit of future NASA and non-aerospace applications." ■

**LEARN MORE ABOUT NASA's
Decommissioning Project.
See Our Next Edition in October.**